Stand Establishment From Seeded Native Grasses

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INTRODUCTION

Interest in reseeding of degraded rangelands with native species has increased dramatically in recent years. The availability and cost of native seed can limit the acreage considered for native reseeding. In addition, limited knowledge of seeding rates, dormancy characteristics and population patterns for native species can make management decisions difficult. Seeding rates are often based on experience with introduced species with similar seed characteristics, and stands have traditionally been evaluated the first year after seeding. If a species had high germination rates, then the first year evaluation was appropriate. However, if seed dormancy is part of a specie's adaptation to a fluctuating climate, then several years or more may be necessary to fully evaluate the success of seeding. The goal of this study was to evaluate the effect of seeding rate with four species of native grasses over a two-year period.

METHODS

The study site was located near Horse Mountain and BRIM well in Lake County about ten miles southwest of Wagontire, Oregon. The site was dominated by Wyoming big sagebrush (Artemisia tridentata spp. wyomingensis (Beetle & A. Young) Welsh) that had been burned in the fall of 1990. Four species common to the area were chosen; Basin wildrye (Elymus cinereus Scribn. & Merr.), bluebunch wheatgrass (Agropyron spicatum (Pursh) Scribn. & Smith), bottlebrush squirreltail (Sitanion hystrix (Nutt.) Smith), and Indian ricegrass (Oryzopsis hymenoides (R. & S.) Ricker). Each species was seeded with a rangeland drill in replicate five acre plots at a high and low seeding rate (Figure 1). A total of twenty plots or eighty acres was seeded and fenced to exclude livestock and rabbits in the fall of 1991. The high seeding rate for Basin wildrye, bluebunch wheatgrass, and bottlebrush squirreltail was 10 pounds of seed per acre, the low rate was 5 lbs/acre. Indian ricegrass seeding rates were 6 lbs/acre and 3 lbs/acre, respectively. Within each five acre block we established four permanent 1.2 yard² (1m²) plots. Within each we counted seedlings in two drill rows. Sampling was conducted three times in 1992 and 1993. Precipitation and temperature were triangulated from weather stations at Squaw Butte, Alkali Lake, and The Poplars (Figure 2).

RESULTS AND DISCUSSION

The highest seeding rate resulted in higher seedling numbers for Basin wildrye, bluebunch wheatgrass, and squirreltail in April 1992 (Figure 3). We also measured the highest number of Indian ricegrass seedlings in April 1992, but at the low seedling rate. The winter following the seeding was very dry for most of eastern Oregon. However, the study

site received 0.8 inches of precipitation in March and temperatures were fairly warm (Figure 2), which may account for the relatively high seedling densities in April 1992. Seedling densities declined over the course of the 1992 sampling period for all species (Figure 3).

In 1993, average seedling density was similar across sampling dates for both seeding rates (Figure 4). The exceptions were Basin wildrye on June 30 and July 27, and Indian ricegrass on July 27 (Figure 3). In several cases the seedling density at the end of 1993 was higher than at the end of 1992, which showed that there may have been carry-over of dormant seed. Both Indian ricegrass and Basin wildrye had higher seedling densities at the higher seeding rates. But, the average for all species shows no difference between seeding rates (Figure 4).

We conclude that the higher seeding rate may be desirable for some species, but when averaged there was no benefit. Such a result has economic implications because twice as many acres could be seeded using the low rate. In general, seedling numbers increased slightly the second year. We intend to follow seedling numbers again during the spring and summer of 1994, and conduct another seeding in the fall of 1994.

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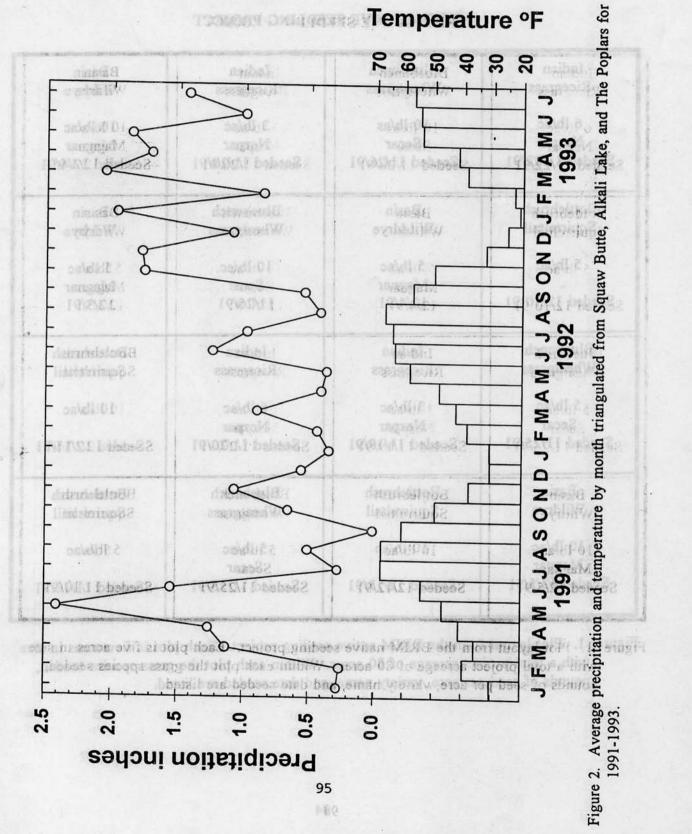
BRIM NATIVE SEEDLING PROJECT

| Indian | Bluebunch | Indian | Basin |
|-------------------------------------|--------------------------------------|--------------------------------------|------------------------------|
| Ricegrass | Wheatgrass | Ricegrass | Wildrye |
| 6 lb/ac | 10 lb/as | 3 lb/ac | 10 lb/ac |
| Nezpar | Secar | Nezpar | Magnar |
| Seeded 11/22/91 | Seeded 11/26/91 | Seeded 11/20/91 | Seeded 12/4/91 |
| Bottlebrush | Basin | Bluebunch | Basin |
| Squirreltail | Wilddrye | Wheatgrass | Wildrye |
| 5 lb/ac Seeded 12/10 91 | 5 lb/ac Magnar 12/4/91 | 10 lb/ac Secar 11/26/91 | 5 lb/ac Magnar 12/3/91 |
| Bluebunch | Indian | Indian | Bottlebrush |
| Wheatgrass | Ricegrass | Ricegrass | Squirreltail |
| 5 lb/ac Secar Seeded 11/25/91 | 3 lb/ac Nezpar Seeded 11/19/91 | 6 lb/ac Nezpar Seeded 11/20/91 | 10 lb/ac Seeded 12/11/91 |
| Basin | Bottlebrush | Bluebunch | Bottlebrush |
| Wildrye | Squirreltail | Wheatgrass | Squirreltail |
| 10 lb/ac Magnar | 10 lb/ac | 5 lb/ac Secar | 5 lb/ac |
| Seeded 12/5/91 | Seeded 12/12/91 | Seeded 11/25/91 | Seeded 11/10/91 |

Figure 1. Plot layout from the BRIM native seeding project. Each plot is five acres in size with a total project acreage of 80 acres. Within each plot the grass species seeded, pounds of seed per acre, variety name, and date seeded are listed.

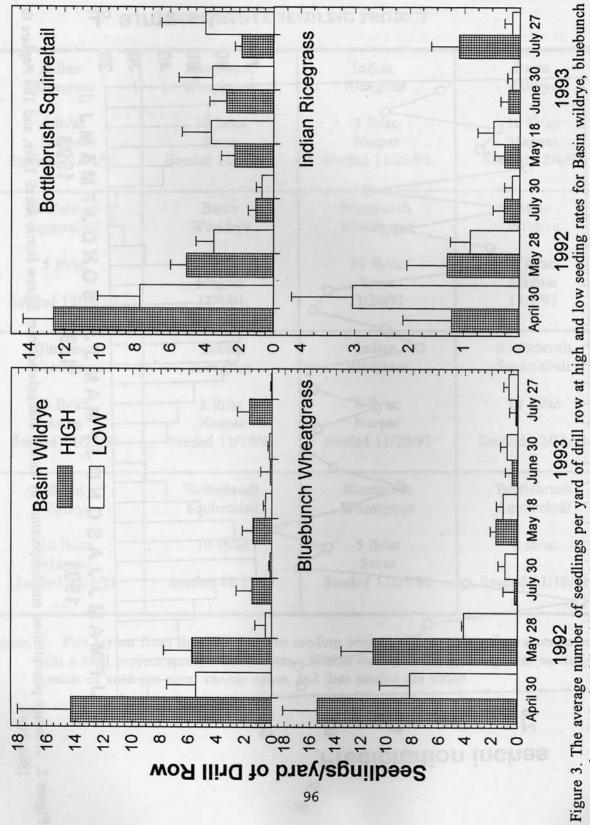
94

Precipitation inches



95 PBQ





wheatgrass, bottlebrush squirreltail, and Indian ricegrass in 1992 and 1993 at the BRIM seedling site.

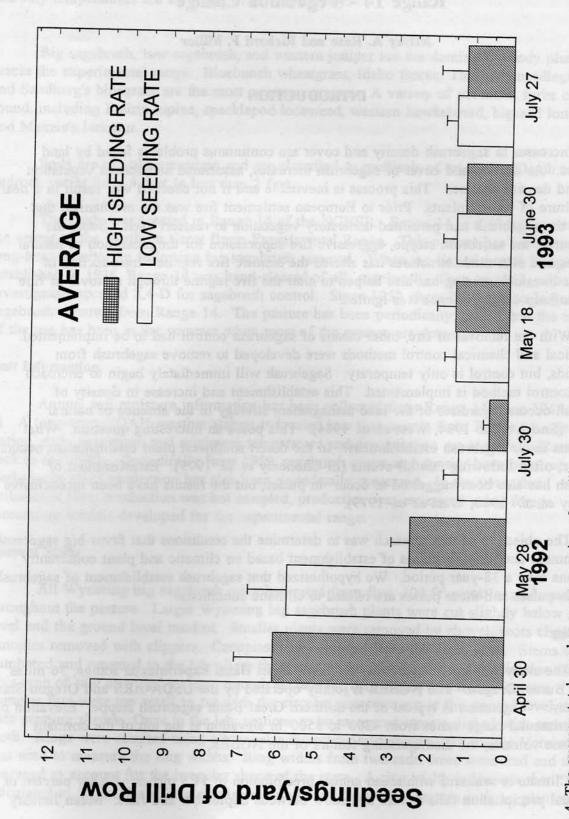


Figure 4. The average total number across species of seedlings per yard of drill row at high and low seeding rates for in 1992 and 1993 at the BRIM seedling site.